Envisioning tropical environments:

Representations of peatlands in Malaysian media

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> "Changing the ecological futures of peatlands directly relates to changing the ways in which people perceive and value them…Global climate action is not only about science and facts" (Gladwin, 2017: 2)
>
> "Power relations are encoded in media representations, and media representations in turn produce and reproduce power relations by constructing knowledge, values, conceptions and beliefs. It is for these reasons that representations matter" (Orgad, 2012: 25)

Introduction

An article published in *The Guardian* newspaper in 2017 agreed with the first quote above. "Ultimate Bogs: How Saving Peatlands Could Help Save the Planet" concluded that "to save peatlands, we need to see them differently" (Hance, 2017: 4). The same newspaper reported a year later that the UK supermarket chain Iceland had pledged to become the first major retailer "to remove palm oil from its own-brand foods, in a bid to halt the ongoing destruction of tropical rainforests in south-east Asia" (Smithers, 2018: 1). These are but two indications of the role played by media (in this case, an English broadsheet) in an international debate about tropical peatlands development in the world's major palm oil-producing countries, namely Malaysia and Indonesia.

At issue in this debate are fundamental questions about the use value of tropical peatlands and their suitability for commercial development. Malaysia has 2.8 million hectares of peat. The country's peat forests can be generally divided into three types: mixed peat swamp forests (the most decomposed, with the highest peat bulk density and water table); so-called alan forests (the woodiest type with the lowest water table) and "padang alan" forests (less woody and the least decomposed). "Alan" is the local name for the Dipterocarp tree *Shorea albida,* the main tree species from which the peat has been formed (Corley and Tinker, 2016: 80).

While these Malaysian peatlands are attractive areas for commercial cash crop development, those in pristine condition provide important ecosystem services such as water catchment areas, coastal buffers, and carbon sinks. They are also an important source of non-timber forest products (NTFBs) for the communities that live adjacent to them (Evers et al., 2017). Arguments for commercial development of peatlands are thus at odds with counter-arguments for their conservation, protection and/or restoration.

This paper addresses issues of continuity and change, similarity and difference via a qualitative content analysis of representations of tropical peatlands in Malaysian media over a twenty-year period. Part one highlights how concepts of colonial framings provide a useful theoretical framework for the arguments in this article. Colonialism was a system of land dispossession enabled and sustained by foreign rule, by notions of private property and by geopolitical imaginations of people and landscapes. Postcolonial theory traces the legacies of colonial thought and practice in present-day relations of power, including in relation to land use (see for example Manzo and Padfield, 2017). Our analysis is thus informed by a postcolonial perspective as well as by a range of relevant studies in the social and physical sciences.

Part two covers all aspects of the research design. It explains the focus on media; the choice of media; the selection of articles (including the time frame); and the mode of analysis. That last category covers frame analysis and qualitative content analysis. Part two also explains how we came to concentrate on a particular form of linguistic expression that has not been highlighted before in peatlands studies, namely textual metaphor.

Secondary reading across disciplines provides historical context and intellectual insight; it has shaped our own conceptual language, understanding and arguments. Part three (on the development narrative) and part four (on conservation) therefore draw on relevant readings before presentation and discussion of the research findings. A summary table is included in each section for heuristic and comparative purposes.

While it is unsurprising that English-language media in Malaysia are in tune with wider narratives of development and conservation, our close analysis of metaphors reveal some more

nuanced and unexpected findings. We found arguments in favour of both conservation and development and an array of representational practices in Malaysian media. We also found arguments *against* contested uses of peatlands and concerns about significant challenges and obstacles to conservation. Metaphors are indicative of the ways in which arguments are framed, reflecting varied approaches to conservation as well as different approaches to development. As well as differences, however, we found similar metaphorical expressions criss-crossing lines of debate. Land container metaphors that envision tropical peatlands as receptacles of economically valuable natural resources are by far the most common, as reflected in the taxonomy of metaphorical types used in this paper.

We don't dispute the importance of adjectives[1], however this paper argues that metaphors matter as well and warrant greater attention. We ultimately question the value of land container metaphors that re-inscribe a firm boundary between humanity and the environment. We find that within the Malaysian media, when conservation arguments are expressed in terms of a modern "society-nature antinomy" they facilitate a capitalist vision of nature as a resource to be exploited for market exchange and thus profit (Skandrani, 2016: 1). This further fuels so-called neoliberal, market-based approaches to conservation that assign a monetary value to nature and seek exchange value in non-extractable assets such as tropical carbon. At a time of wider debate about market-centred conservation, we therefore end with a call for ongoing attention to different forms of metaphorical expression in environmental discourses and planning.

Colonial Framings of Peat

Different rationalisations reflect colonial views of the world; theories of development; and the research outputs of disciplines and sub-disciplines such as hydrology, conservation biology and climate science. Arguments are also undergirded by dissimilar conceptions and valuations of nature. In a capitalist development framework, peatlands are valued in terms of exchange; they

[1] It certainly matters whether peatlands are considered dry or wet, shallow or deep. The application of "dryland" development models to tropical areas of bog, swamp and mangrove is inherently problematic.

are envisioned and commandeered as natural resources (notably trees and soil) that can be utilised and exploited for commercial gain through logging and planting. This conception of nature – as simply a site of resource extraction, a natural capital asset and a source of natural advantage in a competitive global economy – underscored colonial commercial extraction in so-called wastelands everywhere.

Our frame of reference here is tropical environments; however, we note that the diffusion of colonial narratives about peatlands was not only from global North to South or from temperate zones to the tropics. Quintessentially colonial adjectives applied to people and places were *backward*, *lazy*, *diseased* and *unproductive*. These were at work in English inscriptions of Ireland and in the former Russian Empire and Soviet Union. Colonial stereotypes of the Irish as lazy, unproductive "bog men or bogtrotters" circulated in eighteenth and nineteenth-century English texts that conflated "Irish men with the wasteland of the bog" (Kavanagh, 2019: 68). The largest known peat deposits in the world are in the current Russian Federation. These have been similarly envisioned as wastelands. Private land titles (which, from 1782, included not only land surfaces but also subterranean assets) combined with rising timber prices heightened economic interest in peatlands transformation. Untouched peatlands were associated with backwardness, ill health and disorder, in negative contrast to other exemplary landscapes - notably Russian forests and English parks and gardens. Areas remote from densely populated regions – such as the vast Siberian peatlands – did remain largely untouched by Soviet energy development schemes in the twentieth century. Elsewhere, extensive drainage of mires and bogs to facilitate commercial agriculture and forestry continued apace during the Soviet era (Bruisch, 2018).

Pejorative adjectives were notably intertwined with container metaphors in discussion of colonised lands. Physical objects and spaces "that are bounded by surfaces" are often viewed "as containers with an inside and an outside" (Lakoff and Johnson, 1980: 29). In the colonial gaze, uncultivated lands were seen as empty, idle, unfarmed and unfenced (and therefore supposedly unclaimed). Emptiness was clearly a metaphorical term because colonizers knew that landscapes were not literally empty of users. They were metaphorically empty of owners. If

colonised peoples were not demonstrably bearers of rights in private property, then the land was not considered *theirs* even if they were physically *there.* Emptiness was also evidently a container metaphor; it signified lands of potential value but devoid of innate value (rather like empty plant pots) in the absence of saleable assets.

The idleness metaphor was more complex. In contemporary parlance - as defined by the Organisation for Economic Cooperation and Development (OECD) – idle land is "land that was cultivated but is now in a state of disuse; abandoned land; fallow land"[2]. This was not how the term was applied to the colonies. The supposedly unproductive peatlands of colonised Ireland, for example, were blamed by English commentators on "the Irish man's 'want of industry' or 'laziness'" (Kavanagh, 2019: 69). The tropics too were viewed as uncultivated and therefore unused. This was sometimes explained in terms of natural bounty. Availability presupposed idle hands and an absence of labour by precluding the needed for exertion (Blaut, 1993).

Under colonialism, the idle lands=idle hands equation was a dualistic metaphor in the sense that nature was envisioned as both inanimate and anthropomorphic (i.e. having human characteristics). The tropics were metaphorical containers akin to large fruit baskets; they were full of consumables but empty of labour and saleable crops. Tropical areas were also personified through the same adjectives applied to their supposedly lazy, indolent and inactive occupants. Popular cartoons, such as one "showing the native sitting under the coconut tree, waiting patiently for his food to drop into his hands" are indicative of this particular viewpoint (Blaut, 1993: 77). Bounty was thus paradoxically a positive signifier of plenty and a negative signifier of lack. Continuity is evident in contemporary policy narratives that "tend to see the frontier in terms of absences: the lack of productive land uses, forms of modernised agriculture, and a disciplined labour force" (McCarthy and Cramb, 2009: 113). The identification of these lands as idle and underutilised remains problematic, as they are often used for community farming or as areas for hunting and gathering.

[2] See the entry for "idle land" in the online OECD Glossary of Statistical Terms (https://stats.oecd.org/glossary/detail.asp?ID=1276)

Ongoing associations of rural modernity with export-oriented production and the agrarian transformation of supposedly underutilised, backward, unproductive and idle land into large-scale, capital-intensive plantations thus highlight the persistence of such colonial conceptions of peatlands (Cramb, 2011; see also McCarthy and Cramb, 2009).

Colonial narratives in contemporary voices

The tenacity of the assumption "that land is idle because the people who occupy it are idle" is arguably apparent in contemporary endorsements of oil palm expansion in Sarawak, Malaysia (Cramb, 2011: 279). The transformation of peatlands into oil palm plantations has been justified furthermore as an attempt to "rehabilitate" idle lands to make them productive (Colfer, 2002). However, these colonial narratives are not the only source of support for drainage-based agriculture in tropical peatlands. Arguments for continued development also come from the "divergent expertise"[3] of a "subset of scientists working in Indonesia and Malaysia" who script undisturbed peatlands as natural emitters of the greenhouse gasses contributing to climate change (Goldstein, 2015: 762). They argue that peatlands can be developed in a sustainable manner, particularly for palm oil. To support this argument, these scientists have produced findings that show lower soil CO_2 flux (carbon dioxide movement out of the soil; an important indicator of emissions related to climate change) on oil palm plantations situated on peat compared to that on forest ecosystems and sago plantations on peat (Melling et al., 2005).

This flies in the face of an international consensus that dangerously high emissions everywhere are anthropogenic in type. Current scientific understanding is that artificial drainage systems undermine carbon emissions reduction efforts by transforming tropical peatlands from "carbon stores to carbon sinks" (Evers et al., 2017: 538) and from carbon sinks "to a carbon source" (Goldstein, 2015: 762). This is due to the high levels of carbon emissions from disturbed peatlands (Page et al., 2002, 2013; Hooijer et al., 2010). The disturbance of peatlands is also

[3] Described by Goldstein as alternate, industry-affiliated scientific knowledge networks countering consensus, which conjure doubt and scientific ambiguity on particular issues

associated with an increasing frequency of transboundary haze events (Padfield et al., 2016; Varkkey, 2016). These haze events have a major impact on countries in Southeast Asia, including closure of schools, an increase in respiratory illness, disruption of airline schedules and adverse impacts on local businesses and tourism (Emilia, 2014). The dominant scientific position on peatlands management is therefore that the globally significant stocks of below-ground carbon held in deep peat soil are best left where they are rather than commercially extracted or accidentally released. Local supporters of this position have been sometimes dismissed as agents of colonialism themselves. This happened, for example, to Malaysia's former leader of the opposition and current Prime Minister-in-waiting, Anwar Ibrahim, when he called for Malaysian companies to stop planting oil palm on peat, due to carbon emissions and sequestration concerns. Ibrahim's call was dismissed by the palm oil industry as a sign of co-optation by Western, or indeed colonial, interests who were antithetical to Malaysian prosperity (Ooi, 2013).

All of this raises fundamental questions about continuities and changes in colonial representations of peatlands over time. To what extent are those representations contested, where and by whom? To what extent, furthermore, have arguments for conservation been embraced in Malaysia itself, and in what terms? The level of education and awareness of the general public, especially young people, on the importance of conserving wetlands is demonstrably low (Ibrahim et al., 2012). However, there are still countervailing forces to palm oil development on peatlands. One is the 1971 Ramsar Convention on Wetlands of International Importance. This came into force in Malaysia in 1995 and the country now has seven official Ramsar sites. The convention has arguably undermined negative imaginations of peatlands and contributed to their restoration, protection and conservation in other signatory states, for example in contemporary Russia (Bruisch, 2018). Rather than assuming a monolithic, palm oil-centred development agenda, we therefore ask how peatlands have been envisioned in narratives of both development and conservation in Malaysian media.

Research design and methods

Newspapers and online news media play a recognised role in the formation of public opinion; they constitute "an important reflection of, as well as influence on, public debate" (Forsyth, 2014: 76). In terms of environmental discourse, the media perform a central role in communication of issues, events, policies and negotiations (Foxwell-Norton and Lester, 2017). Moreover, Chilvers (2018) calls for a greater engagement with media representations research within the context of deliberative and participatory approaches in environmental geography. Despite a growing body of research on media representations of climate change in the Global South (e.g. Manzo and Padfield, 2016), few studies have attempted to examine media reporting of a specific type of ecosystem therein, especially one with global significance, such as tropical peatlands.

Three newspapers (*New Straits Times* [*NST*], *The Star, Borneo Post*) and one news website (*Malaysiakini*) from Malaysia were selected for this study. The three newspapers represent a cross section of national and local media, including the two most widely distributed and read English-language newspapers in the country (*The Star* and *NST*), and a provincial newspaper (*Borneo Post*) which reports primarily on news stories in East Malaysia. Historically, *The Star* and *NST* are known to have political links to the former ruling national party of Malaysia, *Barisan Nasional* (which was defeated by the *Pakatan Harapan* coalition in May 2018) and thus analysis of these newspapers offers the advantage of "indexing" of government policy and activity. East Malaysia is home to 74% of Malaysia's peatland, including 1,697,847 hectares (69% of Malaysia's total peatlands) in the state of Sarawak alone (Wetlands International, 2010). Analysis of the *Borneo Post* thus offers insight into a localized perspective of peatland reporting. The online news website, *Malaysiakini* is regarded as one of the most well-read and respected independent news websites in the country (A. Winifred, personal communication, 10 December 2014).

Despite English language newspapers representing a third of annual circulation (see Table 1), the English language press is widely accessible in Malaysia, particularly in urban areas where 76 per cent of the Malaysian population live (World Bank, 2018). Furthermore, since English is compulsory in schools and the medium of instruction in many of the higher education

institutions, newspapers are not read solely by "those in agenda-setting positions" (Billett, 2010: 4). Whether the metaphors we discuss in this paper are equally at work in Malay media, which arguably appeal to different audiences, is an issue we intend to explore in future research.

Table 1: Circulation figures of media grouped by language (Bahasa Malaysia, Chinese and English) for, 2017

Print media grouped by language	Circulation figures in 2017 ("000)	%
Bahasa Malaysia	2,290	42.6
English	1,802	33.6
Chinese	1,273	23.7
Total	5,366	100

Source: Audit Bureau of Circulations Malaysia, 2018

Data collection involved a keyword search for news articles in each of the four news media containing one or more of the following words: "peatland", "peatlands" and "peat". Each keyword was searched for throughout the full text of the newspaper, including headlines, sub-headlines and the article itself, and all sections of the newspaper and supplements were included in the search. We were interested in analysing articles that pre-dated the Southeast Asia crisis in 1997 – the first occasion in which transboundary haze was regarded as a major problem (Forsyth, 2014) – through to the present day. Notwithstanding *Malaysiakini,* which started as an online website in 1999, the three print newspapers were established before 1997 and thus in theory supported our longitudinal ambitions for the study. However, due to inconsistencies in the archives, articles were only available for analysis for each news media for the following periods: *NST* (1st January 1995 - 31st December 2017); *The Star* (1st January 2003 - 31st December 2017); *Borneo Post* (1st January 2011 - 31st December 2017) and *Malaysiakini* (1st January 2000 - 31st December 2017). While the period of analysis was different for each of the

studied media it still provided the opportunity to compare and contrast recent historical trends in the reporting of peatlands.

Articles were accessed from the *LexisNexis* database for the *NST* and via the respective online archives for each of the news media. Overall, the keyword search generated 1,403 individual articles – 703 (*NST*), 337 (*The Star*), 252 (*Borneo Post*), and 111 (*Malaysiakini*) – all of which were analysed for this paper. From these, one hundred articles were randomly selected for initial analysis, the aim being to generate an efficient number of thematic categories for classification purposes.

Our chosen method was qualitative content analysis, which "focuses on the characteristics of language as communication with attention to the content or contextual meaning of the text" (Hsieh and Shannon, 2005: 1278). Qualitative content analysis is an intensive approach designed to generate meaning via a "systematic classification process of coding and identifying themes or patterns" (Hsieh and Shannon, 2005: 1278). As these articles were generally only available in text-only format excluding any accompanying visuals, and also due to associated copyright limitations, our content analysis was limited to text only.

Such a process can be inductive or descriptive (i.e. thematic categories are generated by the data itself); deductive (classification is based on existing theory and relevant literature); or a combination of both. Although inductive analysis has been described as the "conventional" method (Hsieh and Shannon, 2005: 1279), our approach was deductive for a couple of reasons. Firstly, inductive analysis is most appropriate when theory and/or secondary literature on a topic are sparse. That is not the case here, as there is a wealth of material in a number of disciplines on the two key themes in the international debate about the value of peatlands, i.e. development and conservation. There is also a substantial body of writing on metaphors (in science and elsewhere), which informed the classification of metaphorical types contained in the paper.

Secondly, a deductive approach is consistent with conventional "frame analysis" in media studies, where each article in a sample is read for content and re-read as necessary as a means

to identify the key frames (Zehr, 2009). The frame concept refers to a storyline or unfolding narrative about an issue and these are searched for within news articles. Frames can be entirely focused on a single-issue, e.g. GMO crops, or "larger frames that transcend a single issue" (e.g. climate change) (Manzo and Padfield, 2016: 3).

From the sub-sample of 100 articles, four frames were agreed upon by the co-authors[4]. The remaining articles in the total sample were then analysed deductively for these four pre-identified frames. Allowing for the possibility of hybridisation of frames within a single article, we coded each article for every one of the pre-identified frames found, however fragmentary. This approach meant that some articles received multiple codes while others did not. One author coded the articles to ensure the highest possible reliability. For validation purposes, each co-author cross-checked the original codes from a sample of ten from every hundred and changes were made to the assigned codes if agreed on by the other authors.

Table 2: Frames for tropical peatland identified in this analysis

Frames		**Key themes**	**Audience engaged**
i)	Development of peatland	Pro-cultivation of crops such as palm oil, rice, water extraction from peat swamps; Peat as energy source; External threats to peatland development from trade and policy barriers	Large-scale agricultural developers (oil palm, sago, pineapple etc.), smallholder farmers, property developers, infrastructure developers, industry associations, trade and economic development government ministries.
ii)	Conservation of peatland	Protection; Conservation; Preservation; Raising awareness	Environmentalists, NGOs, conservation scientists / researchers.

[4] Namely "development", "conservation", "sustainable development" and "haze". This paper is part of a larger study of representations of peatlands in Malaysian media, including a trends analysis paper of our agreed-upon frames over time (authors, in preparation). Since the research focus of this paper is centred on development and conservation discourses, it uses only two out of our four frames for analysis here: "development of peatland" and "conservation of peatland" (see Table 2).

	of ecological and social values of peatlands	

Finally, this paper pays particular attention to metaphors because they are one of the tools frequently used for representing nature (Kwa, 1987) and the environment (Bostrom and Uggla, 2016). Metaphor plays "a generative or creative role" in science and is one of the three key dimensions of the ecosystem concept, the others being meaning and model. The metaphorical dimension appears "in common parlance, and in public dialogue" (Pickett and Cadenasso, 2002: 2); it serves "as a means of communication between scientists and the lay public" (Kwa, 1987: 414). The use of popular, common-sense language is crucial for public comprehension, engagement and awareness of environmental issues. Metaphors "can be a valuable tool for raising awareness" (Crompton, 2016: 12). Metaphor is thus important as a vehicle of communication and a mode of translation (of science into popular language); it is not simply a "pervasive" form of expression in everyday life (Lakoff and Johnson, 1980: 3). This can be seen clearly from subsequent sections and tables. The taxonomy of metaphorical types identified are as follows: ontological (peatlands as containers and as people); cybernetic (peatlands as machine systems); organic (peatlands as living organisms and as human organs); and aquatic (peatlands as bodies of water).

Lands suitable for commercial extraction: the development narrative

> "The fruitfulness of tropical environments was much debated by nineteenth-century scholars. Some argued that tropical regions are lush and bountiful…Our concern now is with the exact opposite thesis, which asserts, quite simply, that tropical environments are miserably poor in their potential for agriculture and it is this that prevents tropical regions from developing" (Blaut, 1993: 71).

Development in colonial Malaya

Through the colonial gaze, Tropical Asia was sometimes inscribed in the "miserably poor" thesis that tropical soils were low in fertility and high in erodibility due to abundant rainfall. This view

combined with wider misconceptions of a so-called Asiatic mode of production that was denigrated as “hydraulic” (i.e. irrigation-based) in “one grand and sweeping judgement of inferiority” (Blaut, 1993: 80). In all these cases, the ideal model of agricultural development was rain-fed farming in temperate Europe. Tropical environments defined in relation to that ideal were found wanting. They were “wastelands” in every sense of the term - barren, overgrown and/or desolate areas of wasted potential.

The “wastelands” classification demonstrates that assessments of soil quality and land availability were central to colonial agricultural development. Another key factor was colonial assessments of the value of trees. The main plantation crops in nineteenth century colonial Malaya were tapioca and coffee. By the early twentieth century, “British capitalists were seizing the opportunity to make fortunes by investing in Malayan rubber plantations” (Hagan and Wells, 2005: 144). Planted into mineral-rich soils, rubber trees were not cut down for their timber; they were tapped for their sap. Profitability drove expansion so that by the start of World War II, rubber estates in Malaya had spread over two million acres of land (Hagan and Wells, 2005).

Cash crop production outside of peatlands was therefore central to development in colonial Malaya. So too was tin mining. Commercial mines were fundamental to capital accumulation in many export-oriented colonial economies. Subterranean discoveries added depth perception to understandings of natural value. Visible soil quality on land surfaces was irrelevant where natural capital assets were found deep underground. In terms of container metaphors, land in mining areas was more akin to an underground storage tank than an empty plant pot or basket of fruit.

The dualistic modernisation theories of the time conceived of plantations and mines in terms of a modern sector that was both the driving force of change and the end-point of development. Beyond this were the imagined traditional sectors and/or frontier areas that might, in the right circumstances and “with the implementation of the right policies” (McCarthy and Cramb, 2009: 113) acquire some use value if not exchange value of their own. This was to be the case with

Malaysian peatlands, where agricultural development was avoided altogether until the late 1950s (Phillips, 1998).

The twin pillars of the colonial mode of production required railway and road networks to link inland areas to coastal ports. As most peat soils developed in Southeast Asia "in or near coastal plains as early as 30 000 years BP" (Wosten et al., 2006: 157), peatlands initially acquired a value that was more about location than economic potential. The modernisation theory of the 1950s and 60s emphasised the built environment (infrastructure provision, energy generation, urbanisation and industrialisation) and not just the natural environment (i.e. agricultural development via cash crop production). Consistent with this logic, drained and reclaimed peatlands were considered desirable for the development of highways, housing, and industrial uses, such as industrial waste water treatment and energy production (Blain et al., 2006; Phillips, 1998).

A policy statement delivered to the United Nations Climate Change Conference (COP 21) by the Government of Malaysia noted that "in the 1960s and 70s, peatlands were considered a wasteland and draining was considered an effective rehabilitation to improve the productivity" (Government of Malaysia, 2015: 4). This suggests both continuity and a shift in thinking in those decades, whereby peatlands become available for crop cultivation via interventionist hydro-management. However, "the difficult working conditions for heavy machinery, low agricultural potential and sufficient availability of land on mineral soils" meant that Malaysian peatlands "were largely undeveloped until the 1980s" (Miettinen et al., 2016: 67).

The palm oil boom

It was the burgeoning need for land brought about by the oil palm boom in Malaysia that encouraged the conversion of peatlands to oil palm plantations. To convert and prepare peatlands for planting, peat swamps have to be cleared from vegetation, drained, and dried so that the water table drops. This is done by constructing drainage ditches that allow water to drain out of the area (Blain et al., 2006). Without adequate drainage, plantation trees are unstable and readily subject to "windthrow" or "blowdown" (i.e. trees uprooted or broken by

wind). If cleared and allowed to dry out then the peat shrinks, revealing soil that is acidic, low in oxygen and inorganic ions, high in carbon, and has high concentrations of humic acid (Phillips, 1998). It is thus the infertile conditions produced by intervention that make drained peatlands problematic sites for the production of most crops.

Nonetheless, Tan et al. (2009) argue that palm oil can be cultivated if peatlands are deeply drained. Some research has shown that oil palm has a high tolerance for areas with fluctuating water tables (Liew, 2010) and oil palm grown on reclaimed peat soil has a particularly high fruit production (Ministry of Forestry, 2009). So by the 1980s, with most inland forests on the Peninsula cleared, plantation companies began building dykes to dry peat swamps to increase their acreage (Nowak, 2008) and the reclamation of peatlands increased drastically as most new oil palm plantation land was opened up on reclaimed peat swamps (Wicke et al., 2011). While the constraints discussed above make oil palm development on peat soil more expensive (with set up costs on peatlands almost double those on regular mineral soil) (Liew, 2010), higher oil palm trading prices have made this economically viable.

Opening up peatlands for plantations is attractive to concessionaires for several reasons. Firstly, commercially valuable timber growing in these areas can be harvested and sold to cover startup costs (Casson, 2002; Stone, 2007). Secondly, the wet nature of peatlands means communities rarely settle there, hence they are usually free from (often expensive and high-publicity) Native Customary Rights and land-use rights claims[5]. The usually secluded nature of peatlands (far away from towns and cities) also enables plantation companies to evade monitoring by environmental authorities (Varkkey, 2016).

The proposition that peatlands are prime sites for cultivation, especially of oil palm, is paradoxical and nonsensical to many (as discussed in the next part). And yet expansion continues, driven by the continued inscription of peatlands as wastelands, by lucrative financial returns from agricultural commodities - especially palm oil - and by the shrinking availability of

[5] However communities, mainly Orang Asli (native) do settle on the fringes of peatland areas, and enter these areas to harvest NTFBs for subsistence and commercial use

more suitable land. From the 1980s onwards, peatlands have thus been reinvented as lands suitable for commercial extraction. The extent to which this development narrative remains alive and uncontested in Malaysian media is the focus of the following discussion.

Findings and analysis

Table three demonstrates that peatlands have been put to a number of uses. Within the development frame, they have also been understood in metaphorical terms primarily as containers of natural resources to be either commercially exploited or erased by infrastructure development and construction.

[Table 3 about here]

Palm oil and "divergent expertise"

With regard to palm oil specifically, the "miserably poor" colonial imaginary of tropical peat soils has clearly been significantly updated. Instead of a dichotomy of suitable/unsuitable land, peatlands now sit on a spectrum from most to least suitable and from most to least ideal. One variant is illustrated by a 1997 article about efforts to find commercial uses for old tin mining areas. It described a project carried out by the Perak State Agriculture Agency "aimed at developing idle land" through palm oil cultivation. Unnamed studies apparently showed "that these soils were not only suitable but also had potential for high returns which provided an alternative way to expand the industry by utilising otherwise poor land" (*New Straits Times* [National section], 1997: 17).

A variant of the "otherwise poor" narrative is the vision of tropical peatlands as second-best areas for palm oil expansion. In this inscription, peatlands occupy a middle position on the ideal or suitability spectrum. Media coverage of a 2001 study commissioned by the World Wide Fund for Nature Malaysia, for example, cited three main alternatives to oil palm expansion into "less ideal environments, such as hilly to steep terrain or deep peat soils." These were: increased yields from existing plantations; better land-use planning; and more effective "environmental management systems" (*New Straits Times* [Earth Matters section], 2001: 7).

At greatest remove from the "miserably poor" thesis is the classification of tropical peatland as "very ideal for agriculture development" in general. This viewpoint was expressed by the Sarawak Oil Palm Plantation Owners Association (SOPPOA) in 2011, in an article that further described the oil palm plantation as "a net 'carbon sink'" with a very important role to play "in the sequestration of carbon dioxide from the atmosphere" (*Borneo Post*, 2011: 1). SOPPOA shows how corporate interests have embraced the "divergent expertise" of Malaysian scientists such as Dr Lulie Melling, the Director of the Sarawak Tropical Peat Research Institute, or TROPI (known as the Tropical Peat Research Laboratory [TPRL] until 2016).

Founded in 2008 by the Sarawak state government, TROPI is the sole research unit under the Sarawak Chief Minister's Department and Dr Melling reports directly to the Chief Minister. TROPI was tasked specifically to come up with scientific findings to support the development of oil palm plantations on peat (Cheng, 2016) in order to complement Sarawak's agricultural goals and as a way to counter critiques of peatlands conversion. TROPI received significant funding from the state government to do so, including monies to host a major international conference on peat, which was used as a platform to promote peatlands development at the international level (Wijedasa et al., 2016).

TROPI has since become infamous abroad for its research outputs. TROPI argues that oil palm is currently the most economical perennial crop for planting on peat soils as it gives the best return on investment when properly managed (Melling et al., 2011). It points out that oil palm has been successfully grown on peat in Malaysia for generations and there are oil palm plantations on peatlands that have matched the productivity of those on mineral soils (SIIA, 2017). Researchers affiliated to the institute have furthermore produced (disputed; as mentioned above) findings that show a lowering of carbon emissions on oil palm plantations (Melling et al., 2005). TROPI thus argues that it is possible to cultivate almost all peat areas while mitigating its possible negative impacts using specialized agricultural techniques. These include: artificial soil compaction[6] using excavators; a controlled drainage system to maintain

[6] However, compaction has its negative effects. Compacted soil impedes root growth and penetration, reducing the uptake of water and nutrients and possibly resulting in stunted, drought-stressed plants and lower yields (SIIA

stable water table levels; planting oil palm trees on raised mounds to prevent leaning; and use of equipment to push leaning trees upright. These techniques have attracted the attention of Indonesian palm oil interests with a stake in the reclamation of degraded peatlands (*Sun Daily*, 2016).

Dr Melling herself (or Lulie as she is often referred to in Malaysian media) is a controversial figure, and not only because of her counter-factual arguments. There is also the issue of her modes of expression. An article on the My Palm Oil blog entitled "I'll show you how to use your holes" (the title of a 2008 seminar by Dr Melling) describes her as "a master of double entendre"[7]. The "sexy soil" epithet is meant to make peat soil research "excitingly appealing" to those without "scientific background or knowledge." By Dr Melling's own admission the adjective is not original to her, having been borrowed from a US forum titled "Science is Sexy" and the subsequent Scottish tag of "Sexy Peat" (Lulie Melling, quoted in *Borneo Post*, 2013: 2).

More recently, it was Dr Melling who described undisturbed peatlands as "just like a museum" in an attack on Western NGOs accused of wanting "to block us from progressing" (Lulie Melling, quoted in *Borneo Post*, 2016: 4). This derogatory reference to museums stands in notable contrast to its usage within the conservation frame in Malaysia, as shown in part three.

In terms of a global/local or global/national dichotomy, the "divergent expertise" of well-known Malaysian scientists such as Dr Lulie Melling has clearly been received less critically in Malaysian media than elsewhere (especially at the regional level in Sarawak, the location of TROPI). Poor general understanding of peat soil science among Malaysian journalists, and a journalistic principle of balance, are both plausible explanatory factors. However, there is a need to question why certain narratives are formed and whose interests they serve. Consider

2017). It also reduces the ability of the soil to store water and regulate water flows, possibly increasing the severity of seasonal droughts and floods. It furthermore does not address the issue of long-term peat subsidence, as peat above the water table level will continue to decompose and subside until the area becomes permanently flooded and thus unsuitable for planting (SIIA 2017). Despite this, TROPI promotes its "best practices" for oil palm development on peat to local growers, enabling state government officials to maintain that oil palm growers in Sarawak are employing best practices to minimize fire and environmental damage.

[7] See paragraph 5, which describes how this mastery of double entendre brought appreciative sniggers from the audience (http://mypalmoil.blogspot.com/2010/10/ill-show-you-how-to-use-your-holes_24.html

the political and economic interests in palm oil production – indeed, such political interests and social processes can use discourse to reduce environmental complexity to simplified statements that do not necessarily assist environmental management, but often have unfortunate social and political impacts (Forsyth and Walker, 2008).

This is especially prevalent in discursive struggles over the environment in the global South, where powerful interests often use discourse to influence access to land and natural resources (Bryant, 1979). They are powerful in terms of being able to create, legitimise and disseminate perspectives on topics in individual ways, and manage to get other groups (in this case, the Malaysian media) to adopt and contribute to the reproduction of their discourses (Svarstad et al., 2018). It is in this context that our analysis highlights the appeal of Dr Melling's multi-scalar arguments as well as her modes of expression. Far from environmental disaster, palm oil production is linked to a triple agenda of meeting challenges that are global (climate stabilisation), national (prosperity) and regional/local (poverty alleviation in Sarawak). The overarching vision is thus of a universal and irresistible benefit. Furthermore, the potency of colourful expression and mastery of double meanings are not to be discounted. As a calculated mode of scientific communication, designed to heighten the mass appeal of peat soil research, they attract popular media attention to messages.

Other agricultural uses

Table three further demonstrates that palm oil has not been the singular focus of agricultural expansion in Malaysia. Land use for the cultivation of a number of other cash crops has also been endorsed, in part because of perceptions of the suitability of peat soil for a range of tropical foodstuffs. For example, in 2001 the *New Straits Times* (Business section) reported on the arrival in Pahang, Malaysia of representatives from the Celio Group of food companies that markets the Del Monte brand. In welcoming the Group and promising "full co-operation," a spokesman for the Pahang State Government described the area's peat soil as "very suitable for the cultivation of pineapples" (Gerald, 2001: 25).

The logging category, which includes sustainable forestry, signals a post-colonial shift in the political economy of trees, from exchange value based in rubber tapping to commercial timber production. The indisputably negative effects of unrestrained logging are attributed in the data set to two main factors, namely the illegal removal of tree stock and technologically rudimentary machinery. It is only in regard to the latter that peatlands are envisioned metaphorically as something other than inanimate containers.

The conception of forests as "the Earth's skin" came in 2001 from Chong Wee Chong, the chief executive officer of a Malaysian firm (Rimbaka Timber Harvester) that was promoting its "environmentally friendly harvester" as a way to minimise environmental damage from conventional processes. While ontological metaphors often include anthropocentric personification[8] (Lakoff and Johnson, 1980), the "skin" metaphor was classified as organic rather than ontological because it does not script forests as personalities or entire human beings. While the skin is the largest organ that envelops the entire human being, it is still an organ and not a complete being. This is reflected in its application in the text: even though Chong uses "skin" to more broadly describe forests, taken in the context of peatlands, he argues for its protection because even while acting as a protective barrier, peatlands regulate water (permeability) and also carbon (breathability). The next section demonstrates a more prevalent use of organic metaphors in arguments for conservation. This article was framed as development because the ecological value of peatlands is harnessed to a celebration of commercial timber production via technological innovation and corporate ingenuity (*New Straits Times* [National section], 2001: 6).

The aquaculture category in the third row of table three encapsulates a range of arguments for marine fishing, breeding and food processing. Here, peatlands shift from being containers of food crops such as pineapples, rice and sago to a groundwater source for the commercial

[8] The most obvious ontological metaphors are those where the physical object is further specified as being a person.

breeding of food fish (such as prawns and eels) and of semi-aquatic reptiles (like crocodiles) with economically valuable skins.

Aquaculture is the only category within the development frame to find value in swamps. Tropical peatlands are something more than soil and trees; like all peatlands they are also water which is why conventional synonyms are “peat swamp forests” and “wetlands”. The discipline of eco-hydrology refers to peatlands as “complex eco-hydrological systems” (e.g. Morris et al., 2011: 1) and argues against plantation-only land use of tropical peatlands (Wosten et al., 2006). Marine fishing industrialisation does mitigate against the “single sector priority approach” to peatlands development and thus suggests some appreciation “of the full scale of hydrological and ecological values of peatlands” (Wosten et al., 2006: 172).

However, aquaculture includes fish farming, which requires groundwater extraction from peat swamps for the creation of ponds. Commercial marine fishing is thus an extractive industry that values peat swamps only as a groundwater source. Aquaculture is incompatible with “unimpacted hydrology” and is not a way to “keep wetlands wet” (Evers et al., 2017: 534).

Infrastructure on peatlands

The last row of table three shifts the focus from primary sectors of the Malaysian economy to other existing uses for peatlands. Entire coastal towns and road networks, such as the port of Sibu in Sarawak, Malaysia have been built on peatland. The operative preposition for this type of land use is “on” rather than “in”, i.e. development takes place *on* tropical peatlands rather than *in* them. There is thus no perceived value in soil depth, only in what can be placed on the surface. However valuable for other purposes, soil, water and trees are envisioned only as problems to be solved and/or obstacles to be removed. This is apparent in a 1997 article about a road expansion programme in Sibu. In praising the efforts of the Sibu Municipal Council, local journalist A.D. Puah “says that trees also have to be cut down to make way for development and town expansion programmes” (*New Straits Times* [Focus section], 1997: 12).

An article on the same town three years later shows that so-called divergent expertise predated the founding of the TPRL, having begun to emerge around the same time as scientific concerns about carbon emissions from tropical peatlands. Arguments for their protection from agricultural expansion and for the hydrological rehabilitation of peat soils began to proliferate in the wake of major peatland forest fires in Indonesia in the late 1990s (Goldstein, 2015). In 2000, efforts "to overcome the problems associated with this type of soil, which is highly compressible" were reported in an article about the emerging field of peat soil studies within Malaysian universities. Dr Bujang Kim Huat from Universiti Putra Malaysia's Civil Engineering Department was quoted as saying that whilst construction on peat soil was best avoided, "in countries like Malaysia where the soil is predominant, utilisation of this type of land is required in an increasing number of instances" (*New Straits Times* [National section], 2000: 10).

In sum, findings show that peatlands have been put to the service of development in a number of different ways in Malaysia. Colonial imaginaries of poor and idle lands persist despite some evident refinements. Although commercial exchange value has been the main rationale in terms of economic development, infrastructure and building works have been drivers of land use as well. The over-arching engines of change are therefore capital-intensive development and modernisation, not palm oil expansion per se. The extent to which single-issue international campaigns such as the supermarket boycott of palm oil (as mentioned in the introduction) are capable of halting tropical deforestation and peatlands conversion is thus debatable.

The last column of table three demonstrates furthermore that critiques of drainage-based systems of production are not foreign to Malaysia. Environmental damage has been recognised and critiqued. However, a consensus on the need to "keep wetlands wet" (Evers et al., 2017: 534) is not the only possible consequence. Within the development frame, the main alternatives to conservation in Malaysia are the TINA argument for necessity (i.e. the proposition that "there is no alternative" to peatlands conversion) and expressions of faith in the redemptive powers of technology, science and policy.

Arguments *for* conservation – first in historical and intellectual context and then in Malaysian media – are reviewed and discussed in the next part.

Lands unsuitable for commercial extraction: the conservation narrative

> "A forest is much more than just trees… [It is] public values and attitudes, that if showing no or very little concern for environmental issues, or if dominated by public attitudes towards agricultural expansion for economic growth, contribute to deforestation" (Breitling, 2016: 6 and 11).

History of forest conservation

The history of forest conservation is rooted to some extent in what Tsar Alexander of Russia considered an English environmental idyll. Upon his return from a visit to England in 1814, he waxed lyrical about the "perfection" of cropped fields and neat gardens in contrast to the "impenetrable swamps" of the Russian north-west (Bruisch, 2018: 13). Progressive environments were thus equated with cultivation and enclosure, both of which signified private ownership and property rights. The private parks, estates and secluded nature walks of the English aristocracy were a corresponding contributor to the idea that forested landscapes were best maintained and protected by boundaries. The idea that the working classes in industrial cities might also benefit from proximity to nature came later, in response to medical concerns about the health consequences of industrialisation. The concept of urban public parks gained traction in the nineteenth century, during the heyday of "miasmatic theory" (i.e. the notion that disease was primarily airborne). This was also a time when natural processes were commonly represented as human systems. In this context, the "parks as lungs" metaphor became a feature of public debates about the health benefits of nature in cities. Trees and other vegetation were imagined as a pulmonary organ or respirator that would cleanse and purify the polluted industrial air (Crompton, 2017).

Although the capacity of small parks, in particular, to function as anti-pollution devices was clearly overwhelmed by the sheer volume of pollution itself, the "parks as lungs" metaphor was

arguably conceptually sound (Crompton, 2017). Far from disappearing under the weight of continued industrialisation, the "lungs" metaphor has travelled widely in time and space. This is demonstrated by the search term "lungs of the planet" on Google, which generates many millions of entries. As tropical rainforests (the Amazon in particular) are so often the focus, they appear to define the scale and location of contemporary understandings of the expression. However, commitments to forest conservation on much smaller scales, such as in semi-urban communities on the fringes of Mexico City, have also been articulated in those terms. Focus group respondents in one study described their forests as "the city lungs" that played a crucial role in "sustaining critical ecosystem functions" (Caro-Borrero et al., 2015: 144) and this idea was important in mobilising these communities towards conservation there.

Mid way on a spatial scale between small urban parks and entire tropical rainforests sit national parks, the "posterchild" for a traditional Fortress Conservation model of forest governance (Breitling, 2016: 13). As originally conceived in 1832 by American artist George Caitlin, the national parks idea was three dimensional; Native Americans, unspoilt nature/wilderness, and wild animals were all to be protected from encroaching settlement. By the time the world's first national park was created at Yellowstone in 1872 by an act of Congress, Native Americans had disappeared from the frame. The legislation only passed once politicians were convinced the land could not be farmed or mined and that they could get rid of the park later if necessary (Hetter, 2017).

The premise that nature must be enclosed with hard physical boundaries in order to protect it from humans was the cornerstone of the developing national parks movement in the United States. Prior to the establishment of the National Park Service in 1916, national parks were literally fortresses protected by military garrisons nearby, such as Fort Mackinac near the Mackinac National Park established in 1875. Native peoples were erased from the picture, not only in the United States but in the colonies as well. The natural environments made available for protection were those envisioned as either wastelands or wilderness. The former was considered useless for economic development while the latter were scripted as fragile, sensitive, unspoilt and/or pristine. The common adjective was *empty*. This was both a signifier

of lack of cultivation and a conservation objective, whereby humans were to be allowed into protected areas only as occasional visitors and paying guests.

Although the presumption that "pristine, empty wilderness" must remain isolated from human activity remains alive and well (Nelson, 2011: 169) it has not gone unchallenged. The traditional alternative to Fortress Conservation is Community-Based Conservation (CBC), of which there are now two main branches. Integrated Conservation and Development Projects (ICDPs) aim (as the term suggests) to bring benefits to humans as well as to nonhuman species. Key aspects of this approach are tourism in its various forms, with local communities the direct and indirect intended beneficiaries.

Since the end of the 1980s, a market-centred paradigm of CBC has also entered the fray. So-called neoliberal conservation "makes conservation compatible with global capitalism" by commodifying nature; the objective is "to sell nature to save it" (Breitling, 2016: 15). One prominent strategy is Reduced Emissions from Deforestation and Degradation (REDD+), which aims to attach a market price to all natural resources and functions. Stakeholder analysis and "ecosystem services mapping" have attempted to show how tropical mangrove forests might be incorporated into REDD+ (Aziz et al., 2016). The idea that REDD+ might help to arrest oil palm expansion has also been tested empirically. A study using "fine-scale mapping and carbon accounting" argues that "REDD+ can outcompete oil palm in regions with low suitability, with low carbon prices and low carbon stock" (Abram et al., 2016: 2).

Another key strategy of neoliberal conservation, which is also used as an instrument to implement REDD+, is Payment for Ecosystem Services (PES) – a market-based mechanism for recognising the value of nature. At the centre of this conceptual framework are two other, equally multidimensional concepts.

Ecosystem metaphors

First and foremost is the concept of the ecosystem, which is also of American origin. The "three key dimensions" of the concept "are meaning, model, and metaphor" (Pickett and Cadenasso,

2002: 1). Although ecosystems can vary substantially in size, all "have an explicit spatial extent" which "must be specified and bounded" (Pickett and Cadenasso, 2002: 2). Ecosystems by definition are therefore bounded spatial units conceivable metaphorically as ontological containers, like other land areas and "our natural environment" (Lakoff and Johnson, 1980: 29).

That said, secondary reading shows that multiple ecosystem metaphors are possible (and remain cogent) for a couple of reasons. Firstly, some metaphors have stood the test of time and travelled beyond their original contexts, suggesting broad transnational resonance. One is the ecosystem as a machine metaphor, which is classified here as cybernetic following studies of its usage in the USA by Kwa (1987) and in systems biology by Fujimura (2010). Others have classified this as a structural metaphor, along with conceptions of the ecosystem as an organism and also as an algorithm (Pickett and Cadenasso, 2002). Raymond et al.'s (2013) "ecosystem as a house" metaphor could equally be classified as structural. There are also "behavioural metaphors" that "include ecosystems as resilient structures or ecosystems as fragile structures" (Pickett and Cadenasso, 2002: 5).

The second reason for multiplicity (even within a single category, such as the ontological), is that ecosystems themselves vary by type as well as size. Tropical peatlands are a case in point. As tropical wetlands they are a distinct and biologically diverse ecosystem now overseen by their own international treaty (the 1971 Ramsar Convention) and organisation (Wetlands International). Wetlands have been scripted metaphorically in two distinct ways: in ontological terms as a supermarket; and in organic terms as the Earth's kidneys (see for example Su et al., 2009; Sandilyan et al., 2009). The former signifies biodiversity and food provision whereas the latter is more like the lungs metaphor mentioned earlier in its emphasis on cleansing and purification. Put another way, the supermarket metaphor highlights goods while the kidneys metaphor highlights services.

However they are classified, metaphors are commonly used devices in representations of ecosystems. They connote attributes, assumptions, imaginations and values as well as scientific findings and principles. Ecosystem metaphors are also a key dimension of the other main

component of PES, namely the concept of ecosystem services (ES). Originally conceived (in the 1980s) as "a metaphor for the use value of nature," ES has since been criticised for transforming nature into a source of exchange value subject to the market logic behind PES (Silvertown, 2015: 641). Within this context, Raymond et al. (2013) argue that the dominant metaphor used in ES assessments of the value of nature is that of economic production. Other ways of valuing nature, notably for its intrinsic value and/or future value, are implicitly de-emphasised in this framing.

Other possibilities are the "stewardship metaphor" (the Earth as a household to be cared for by humans), the "web-of-life metaphor" that emphasises species connectedness, and the "ecocultural-community metaphor" that highlights associations between the physical, social and spiritual worlds (Raymond et al., 2013: 539-540). Rather than searching for the perfect metaphor, researchers are encouraged to adopt a "deliberative approach" that analyses metaphors in context and makes "implicit metaphors explicit" (Raymond et al., 2013: 544). It is to that task that we now turn, in analysis of the conservation frame in Malaysian media.

Findings and analysis

Table four displays the three main narratives associated with peatlands conservation in Malaysian media. The first two involve some sort of enclosure, albeit on different scales, whereas the last is more open-ended. The "parks" and "gardens" narratives thus represent the two traditional approaches to conservation mentioned earlier, i.e. Fortress Conservation and CBC.

[Table 4 about here]

In terms of a global rationale for conservation, alarm about global warming and carbon emissions is evident as early as 1997, in media coverage of the raging forest fires in Indonesia. Such coverage is broadly in line with the dominant global scientific position on the importance of peatland conservation. One article in the *NST* calls these a "global catastrophe" and talks explicitly about "global warming and long-term climate disruption" (*New Straits Times*, 1997:

13). Agricultural expansion into tropical forests is also sometimes constituted as a threat to a valued global resource. In 1999 for example the *NST* reported on a "three-day International Conference and Workshop on Tropical Peat Swamps," the theme of which was "Safeguarding a Global Natural Resource" (*New Straits Times*, 1999: 15). Such reporting, being in line with international scientific consensus, thus flies directly in the face of TROPI's promotion of "divergent knowledge" on peatland management.

Critiquing development

Articles on the local and national use value of wetlands (in the early years of the data set in particular) share a common view of them as enclaves or islands under threat from encroaching development activities. One example is an article in the *New Straits Times* (*NST*) in 1996 about Tasik Bera, a freshwater lake surrounded by peat swamps and forest, which became Malaysia's first official Ramsar site in 1994. As a signatory to the Ramsar Convention, Malaysia must demonstrate the "wise use" of an ecosystem described by Ecology Asia as "sensitive" and suitable for "low-impact tourism with due regard given to its indigenous tribes"[9]. The *NST* correspondent noted how lowland forests surrounding the lake "have been cleared to make way for Felda oil palm and rubber plantation schemes" despite the "ecological and socio-economic importance" of the area (Yue, 1996: 10).

Types of development generally considered wise are those mentioned by Ecology Asia and consistent with the parameters of CBC, i.e. locally-based tourism and integrated conservation and development projects. The aforementioned article on Tasik Bera does question however whether anyone has actually "asked if the Semelais [local people] would welcome streams of wide-eyed tourists on their ancestral land?" (Yue, 1996: 10). This further highlights a gap in media coverage in Malaysia, where voices of native communities are rarely heard or broadcast.

[9] See Introduction section to the entry on "Tasik Bera - Malaysia's first protected freshwater wetland" at the Ecology Asia website, an established repository for information related to wildlife in Southeast Asia (https://www.ecologyasia.com/html-loc/tasik-bera.htm)

Unwise use is sometimes blamed in the media on ordinary Malaysians but mostly on the forces of extractive development, as the quotes in the last column of table four illustrate. The timing of critiques and challenges suggests they are driven to some extent by regional disasters that have attracted global media coverage. One such disaster was the Asian tsunami of Boxing Day 2004. Within a month, *NST* correspondents described coastal mangrove forests as "the most threatened ecosystem in the country" and bemoaned the loss of land so often viewed as "useless" and "cheap" instead of valuable (Emmanuel and John, 2005: 2). Environmental conservation was soon reconfigured as national protection and human survival – a form of national security and defence (Buang, 2005: 10). A coastline conservation tree planting programme subsequently ensued, as reported on in the *NST* in 2010 (*New Straits Times*, 2010: 12).

Broader concerns about the misapplication of "dry land development models" to wetlands have also been scripted in Malaysian media as a danger to "one of the planet's most important carbon sinks" (John, 2005: 2). A "sink" is an ontological metaphor that implicitly signifies a container for water; it is thus consistent with others in the data set that are classified in the fourth column of table four as organic (peatlands as sponges and kidneys), aquatic (peatlands as reservoirs, water and lakes) and cybernetic (peatlands as water or air filter machines). These metaphors are also consonant with the concepts shown in bold in the second column of table four. These are drawn from secondary readings of academic works on the eco-hydrological functions, benefits and uses of peat swamp forests (see for example Wosten et al., 2006). They are also found in writings on ecosystem services, which typically include water regulation, supply, and flood mitigation among others (see for example Breitling, 2016; Silvertown, 2015).

Containing treasure

The main alternatives to "water carrier" metaphors in table four are those associated with containers of riches or expensive material goods, such as "treasures" and "gold". The description of Bukit Lima Forest Park as a site of "many treasures" and "really a kind of living museum" shows how the same metaphors (museums in this case) can be put to work in very

different ways (*Borneo Post*, 2013). Here a museum is a treasure trove (see Raffaella, 2017) as opposed to a container of untouchable items (as mentioned earlier). In both cases, value is signified by what is inside the container and by accessibility, not by the holding medium per se. A clear difference between the development and conservation frames is the issue of whether value inheres in extraction. This is perhaps most clearly demonstrated in debates about the value of carbon. If this so-called black gold is only valuable when kept "locked away" in deep peat containers, then it must be left undisturbed and cannot be traded in the same way as primary commodities such as palm oil. Carbon can, however, be monetised and offered for sale on "make-believe markets" such as those in carbon credits (Silvertown, 2015: 644).

When taken together, tables three and four demonstrate overlaps as well as differences between the development and conservation frames. Adjectives such as "beautiful," "majestic" and "amazing" all signify intrinsic value and/or future value, as do articles arguing for environmental education (particularly of young people). However, the equation of peatlands with economic use and exchange value is arguably stronger, suggesting the same market-based conservation logic that underpins PES. Whether or not support for PES in Malaysia (as elsewhere) "actually leads to greater protection and improvement, or merely puts a price on destruction" (Silvertown, 2015: 644) remains to be seen.

Conclusion

In a context of international debate about the value of tropical peatlands in Malaysia and Indonesia, this paper explored continuities and changes in colonial representations of peatlands over time. Our principal aim was to understand how arguments for both development and conservation have been framed in relation to wider narratives circulating elsewhere – arguments, notably, about the suitability or unsuitability of tropical peatlands for commercial development. Our frame of reference was English-language Malaysian media over a twenty year period and our mode of inquiry was qualitative content analysis.

Our focus in the paper on linguistic metaphors was not driven by a search for the "perfect" way to express arguments and envision tropical environments. Close attention to metaphor was a

consequence of both secondary reading and the clear presence of different metaphors within the data set itself. In keeping with a deliberative approach, our aim was to analyse metaphors in context; to make implicit metaphors explicit; and to show their connections to different visions of tropical development and conservation.

Our findings show that English-language media are in tune with wider narratives of development and conservation, whatever their arguments. This is demonstrated, first of all, in the way that views are expressed in metaphorical terms that have clear historical roots elsewhere (wastelands, lungs, kidneys and so on).

Secondly, the evident overlaps between the development and conservation frames (as laid out in tables three and four) suggest that Malaysian narratives are largely a microcosm of wider visions, arguments and critiques. Challenges to unchecked tropical development within both the development and conservation frames show that Malaysian media are a site of contestation as well as endorsement – even within the same newspaper, both the narratives of development and conservation are present. However, the extent to which such challenges amount to extensive conservation, whereby peatlands are left completely untouched, appears minimal for a couple of reasons. On the one hand, the limited geographic scope and scale of conservation agendas – especially those with regard to gardens and parks – raises critical questions about efficacy and utility. When are national parks, for example, too small to be of any use? And how large does a peatland area need to be in order to function effectively as both a lung and a kidney? Without discounting the need for further research, we would argue that if peatlands are to be the lungs and the kidneys of the tropics (and not just one or the other) then they need to be left in their natural state with minimal intervention, as argued by Evers et al. (2017) and Wijedasa et al. (2018).

On the other hand, the presence of the development concept within every identified conservation model or type demonstrates the potency of a capitalist vision of nature as a resource to be exploited for market exchange and thus profit. The main issue for debate in Malaysia is not development versus conservation but rather which *type* of development should

predominate (e.g. extractive development versus ecotourism) and at which *scale* (national versus local, rural, regional and/or indigenous). Hence, the emerging argument from this paper is that neoliberal, market-centred conservation – a discourse that assigns a monetary value to nature and seeks exchange value in non-extractable assets such as tropical carbon – is the principal alternative to mainstream, extractive development.

It is the norm that in environmental issues today, parallel discourses are often observed (Svarstad et al., 2018). Ongoing narrative challenges to "divergent expertise" thus remain important – not only because it flies in the face of an international scientific consensus that tropical peatlands should remain undisturbed, but also because of its popular reach. Equally important are continued challenges to the neoliberal language of market-centred conservation that has so permeated conservationist thinking. At a time when the value of peatlands is expressed mainly in terms of economic use and exchange value, circulation of counter-narratives that emphasise intrinsic and/or future value remain equally crucial.

Such counter-narratives, embodied in this paper within the conservation frame, can be identified as "populist", and, far from being "just" ideas, indeed have the ability to influence policy makers and practitioners to think differently about policymaking and general approaches to environmental issues (Roe, 1991: 287). This is in part explained by the ability of these narratives to co-opt peripheral actors and form alliances with dominant institutions (Adger et al., 2001). In this way, such counter-narratives can contribute to scientific progress, changes in policy, and public action. The extent to which the conservation narrative surrounding peatlands in Malaysia can do so is an intriguing subject for future research.

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Table 3: The development frame

Development type/land use	Reported use value/benefits	Representations of peatlands (general)	Representations of peatlands (metaphorical type)	Indicative text	'Voices/Actors' represented	Critiques, challenges, obstacles
Logging/sustainable forestry	***Economic production/growth:*** Wood-based industrialisation; ***Exchange value***: Contribution to GDP	Nature reserves; forests; wastelands; commercial timber; Earth's skin; priceless; heritage; resources	***Ontological*** (containers) ***Organic*** (skin)	"Sarawak's priceless natural heritage" ("CM: illegal logging fuelled by rogue enforcement officers," *MK* 24/11/14) "the forest functions as the Earth's **skin**" ("Malaysian firm promotes environment-friendly timber harvester," *NST 5/3/01)*	Sarawak State Government; machinery company	***Development/land use***: Damage to soil and vegetation; weak demand for timber; ***Policy/management***: Designation of permanent forest reserves (PFRs); lack of enforcement/corruption; illegal logging
Agricultural production/expansion (palm oil, rice, pineapples, sago, tomatoes, longan fruit)	***Economic production/growth:*** Poverty alleviation; income generation; profit; employment; food security; ***Exchange value***: Commercial export; global markets/demand; ***Climate stabilisation***: Carbon capture and sequestration/lowering of carbon dioxide emissions	Highly combustible; idle land; poor land; difficult land; the last frontier of arable land; marginal soil; sexy soil; remote; less than ideal; very ideal; suitable land	***Ontological*** (containers)	Rice cultivation will "make Sarawak a major rice **bowl**" ("Stocking up the **Larder**," *NST* 05/11/97); "Each place can be changed into a **farm**" ("Oil palm on peat in Sarawak," *BP* 26/08/12); "Planting oil palm on peatland actually helps lower carbon dioxide emissions"	Sarawak State Government; large palm oil producer; Malaysian palm oil industry associations; Research institute (Lulie Melling/TROPI)	***Development/land use***: Uncontrolled development; scarcity of more suitable land; loss of biodiversity; wild animal displacement; ***Policy/management***: Designation of permanent forest reserves (PFRs); doubts about the Roundtable on Sustainable Palm Oil (RSPO) certification process; ***Costs***: Drainage; irrigation; production; depth ***Environmental action:*** campaigns; arguments

				("Peat is 'sexy', not a wasteland – Lulie," *BP* 08/09/13) "Like a **museum**" ("Shedding light on peatland viability for oil palm," *BP* 29 May 2016)		***Effects of drainage***: peat fires and haze; soil subsidence and erosion; changes in hydrology; loss of carbon storage; ***Land rights:*** Opposition from native customary rights (NCR) holders
Aquaculture	***Economic production/growth:*** Economic diversification; marine fishing; ***Exchange value***: Export growth	A groundwater source; suitable land (swamps); nursery habitats	***Ontological*** (containers)	"Eel **farm** company planning to rear crocodiles" (*NST* 25/06/96)	Aquaculture company; Agriculture Minister	***Development/land use***: Rates of groundwater extraction; ***Environmental action:*** Complaints from wildlife and nature lovers
Infrastructure expansion and built environment	***Rural modernisation***: Alleviation of traffic congestion; connectedness (of growth centres to coastal areas and towns)	Trees as obstacles to road construction; soft/highly compressible soil; smelly/putrid soil	**Ontological** (containers)	"UCTS [University College of Technology Sarawak] tasked to **unlock key** to peatlands" (*BP* 02/12/14)	Public Works Ministry; Ministry of Local Government and Community Development; Ministry of Finance; University	***Policy/management***: Unwise use; lack of understanding of the soil; ***Costs***: of construction; ***Effects of drainage***: "Whatever you build will sink" ("Here's How According to the Experts," *NST* 27/03/05)

Table 4: The conservation frame

Conservation type/land use	Reported use value/benefits	Representations of peatlands (general)	Representations of peatlands (metaphorical type)	Indicative text	Voices/Actors represented	Critiques, challenges, obstacles
Wetlands national park or wildlife/animal sanctuary	***Development/land use***: Environmentally sound development; tourism/ ecotourism;	Contributors to the national economy; a complex ecosystem; a water filter system; cleaners;	***Ontological*** (containers, people); ***Organic***	"Peat swamp forests, the **kidneys** of the earth" (*NST* 15/07/03);	Environmental NGO; Sarawak State Government;	***Development/land use***: Encroachment; deforestation; farming; sandmining; construction; depletion of water tables; the "weight of development" and Malaysia's "own catalogue of sins"

	Regulation of hydrology: Water catchments and control; filtration; ***Biodiversity***: Wildlife protection/prevention of extinction; ***Community-based conservation (CBC)***: Integrated conservation and development	natural reservoirs; majestic; sensitive; beautiful; a paradise; a fire break; nature's larder; home of rare species; areas not economically viable for development; natural capital	(natural sponges, kidneys); ***Aquatic*** (reservoirs) ***Cybernetic*** (machine systems)	"A kind of living **museum**" ("Treasures of Bukit Lima," *BP* 31/03/13) "**Haven** for wildlife, Payeh Maga" ("Swampland but no wasteland," *The Star* 24/06/15) "The '**Green Lung**' of this town" ("Bukit Lima Nature Reserve a good place to visit," *BP* 26/01/16)		("Upcoming wetland sanctuary set to be ecological watershed," *NST* 13/06/97); "pesky developers" ("Environment snuffed by rabid development," *MK* 25/10/11); ***Policy/management***: Ineffective enforcement; illegal logging; ***Costs***: Clean-up costs; extinction; loss of natural capital ***Effects of drainage***: peat fires and haze; ***Public perceptions/lack of awareness***: Wetlands seen as wastelands
Gardens (botanical/herbal)	***Development/land use***: Tourism; ***Biodiversity***: Preservation of flora ***Research and education***: Environmental education	A passive zone; a habitat of endangered species; a sensitive eco-system	***Ontological*** (containers, people) ***Aquatic*** (water)	"Integrated effort to preserve **Black Water Jewel**" (*The Star* 18/01/08)	Forest Research Institute Malaysia (federal agency)	***Development/land use***: Threats from external activities (e.g. forest conversions nearby)
Environmental protection/restoration	***Development/land use***: Fisheries and forest industries; ***Regulation of hydrology***: Water supply; irrigation; flood control; ***Climate stabilisation***: Carbon storage;	An invaluable resource; sponges; lakes; groundwater storage tanks; water/air filters; sea walls; coastal guardians; a carbon store/sink; amazing; sensitive;	***Ontological*** (containers, people, species); ***Organic*** (lungs, sponges); ***Aquatic***	"**Lungs** of the ecosystem" (*NST* 11/09/01); "The new **black gold**," *The Star* 17/07/2007); "Deep peat forests in the tropics soak up and **lock away** lots of carbon	Environmental NGO, federal agency	***Development/land use***: Economic expansion; industrialisation; development of various sorts; non-sustainable forestry; ***Policy/management***: Poor policies and/or lack of implementation; improper management

	Biodiversity: eco-system balance; ***Socio-cultural value***: Recreation; indigenous livelihoods/survival; clean air	endangered; lungs of the ecosystem; a source of wealth	(lakes); ***Cybernetic*** (machine systems)	dioxide" *The Star* 27/03/10)		***Costs***: Development and management costs; ***Effects of drainage***: Peat fires/release of carbon dioxide/ contribution to global warming; perceived lack of value ***Public perceptions/lack of awareness***: Swamps not seen as valuable assets; ignorance; mangroves seen as useless/cheap land